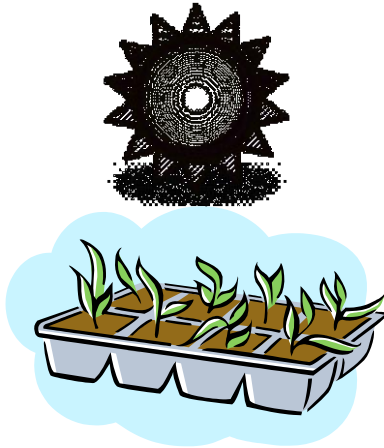


### An Example of Fair Testing

An experiment that has all variables controlled except the one being tested is called a **CONTROLLED EXPERIMENT** or a **FAIR TEST**. This ensures that the results of the experiment are due to the one variable being investigated and not due to other variables.

**Directions:** Read the following description of an experiment and then answer the questions that follow.

A scientist wants to investigate whether plants need sunlight to grow. The hypothesis being tested is: “**Plants require sunlight to grow.**” The scientist placed one tray of sunflower seedlings in the sun and another tray of sunflower seedlings in a cupboard in the laboratory. The seedlings were watered and after 6 weeks the height of each seedling was measured.



Condition A: sunflower seedlings in the sun



Condition B: Sunflower Seedlings in a Cupboard

1. Which variable/factor is being investigated (and therefore changed)?

\_\_\_\_\_

2. Which variables/factors are being controlled? (There are a number of them.)

a. \_\_\_\_\_

d. \_\_\_\_\_

b. \_\_\_\_\_

e. \_\_\_\_\_

c. \_\_\_\_\_

f. \_\_\_\_\_

3. Explain how you would keep two of the variables controlled (the same) during the 6 week experiment.

Variable 1: \_\_\_\_\_

\_\_\_\_\_

Variable 2: \_\_\_\_\_

\_\_\_\_\_

4. Another term for controlling the variables in an experiment is “fair \_\_\_\_\_”.

### **Identifying Variables in an Experiment**

The factor or variable being investigated (or tested) is called the **INDEPENDENT** variable.

The factor or variable being measured is called the **DEPENDENT** variable (because it is dependent on the experiment).

*Directions: For each of the following hypotheses, identify the independent variable, the dependent variable, and two variables that would need to be controlled (constants) in order to perform a fair test (controlled experiment).*

**1. Fertilizer in soil increases flower production.**

Independent Variable: \_\_\_\_\_

Dependent Variable: \_\_\_\_\_

Two Controlled Variables: \_\_\_\_\_  
\_\_\_\_\_

**2. Medicine A will reduce the incidence of headaches.**

Independent Variable: \_\_\_\_\_

Dependent Variable: \_\_\_\_\_

Two Controlled Variables: \_\_\_\_\_  
\_\_\_\_\_

**3. If zinc tablets are taken, then the number of colds per year is reduced.**

Independent Variable: \_\_\_\_\_

Dependent Variable: \_\_\_\_\_

Two Controlled Variables: \_\_\_\_\_  
\_\_\_\_\_

**4. If water is present, then the number of bacteria in garbage bins increases.**

Independent Variable: \_\_\_\_\_

Dependent Variable: \_\_\_\_\_

Two Controlled Variables: \_\_\_\_\_  
\_\_\_\_\_

**5. Girls throw softballs further than boys.**

Independent Variable: \_\_\_\_\_

Dependent Variable: \_\_\_\_\_

Two Controlled Variables: \_\_\_\_\_  
\_\_\_\_\_